Process for Crystallization and Angular Torsion of Outer Layer of Metals for Prevention of Corrosion

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Introduction

The two primary strategies for the development of corrosion-resistant metals are approaches involving the application of coatings to metals and approaches involving permitting metals to partially corrode purposefully so that only the outer layer is corroded and that the concentration of oxygen atoms in that outer layer is so high as to preclude the migration of any additional oxygen from the outside environment into the structure.

Abstract

Here, I will describe a third approach involving the physical alteration of metals to change their molecular organization without making any changes to their molecular composition. If the outermost layer of a metallic object can be forced to take on a crystalline structure and these crystals can be made to twist so that in the outermost layer, rather than a smooth surface, on a nanoscopic scale, the metal has a series of V-shaped grooves. Imagine a series of salt crystals turned on their corners so that a sharp edge is facing up.

On the macro scale, a smooth surface is more corrosion-resistant than a porous surface. However, on the nano-scale, some configurations, namely the above-described configuration, can make oxidation less likely.

This is made possible by the same repulsive effect that generates molecular motion in the interaction between V-shaped water molecules and cubic salt crystals. When a salt crystal makes a near approach to a water molecule, the edge of the salt crystal may enter the 'V' of the water molecule. This results in a strong repulsive force that sends water molecules moving fast enough to prevent their alignment in the crystalline structure associated with a frozen state.

For the same reason, if an H2O molecule carried as water vapor or rain onto a metallic structure such as a bridge comes into close contact with a V-shaped cubic structure composed of metal, it would be strongly repelled without regard to whether it approaches with the sharp end of the 'V' first or the opposite way. This would make it nearly impossible for alignments (visually appearing like a series of chevrons nested within one another) of water molecules to push water (sharp end of the 'V' first) into the metal. A much stronger force would counteract these chance alignments, usually keeping the oxygen in water a fair distance from the metal and, at minimum, preventing these "nested chevrons" from aligning. Only with these alignments is it possible for an oxygen to be liberated from an H2O after water is pushed with sufficient force into a metallic surface.

The question then becomes one of how to efficiently generate these

configurations of atoms in steel, for instance. In the case of most metals, I recommend ultrasonic bombardment of the metal via water during the cooling process. Water, already routinely used to bring about the rapid cooling of steel, can be used to carry patterns of sound toward the malleable, warm metal. The emission of ultrasonic noise via water in the midst of the cooling process should bring about a crystalline structure in the outermost layer of the metal.

The next step is coaxing the very outermost layer into changing its orientation so that the aforementioned V-shapes are generated. This step is deceptively simple as a crystalline metal will respond decisively to a magnetic field. After the ultrasonic input phase is completed and the metal is pulled from the water, a powerful magnet is mechanically swiped at high speed over each facet of each steel beam while the metal is still glowing-hot. The north side of the magnet is oriented at a diagonal angle relative to the metal in order to cause cubic corners to be re-oriented facing straight up.

Conclusion

Metallurgical processes which can create high-endurance materials resistant to corrosion over increasingly long periods of time will improve safety and reduce the costs associated with structural maintenance and replacement.